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EXAMINER

NGO, HUYEN LE

ART UNIT

PAPER NUMBER

2871

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n No.

09/914,854

Applicant(s)

HUGHES ET AL.

Examiner

Julie-Huyen L. Ngo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 18-29 is/are rejected.
- 7) ☒ Claim(s) 16 and 17 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5. 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) submitted on September 4, 2001 was filed after the mailing date of the application on March 2000. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "latch mechanism" recited in claim 1 must be shown or the feature canceled from the claim. No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

The specification is objected to as failing to provide proper antecedent basis for the following subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

In line 21 of claim 1, "one latched state"

In claims 22 and 23, the steps of method claims

Correction is required.

Claim Objections

Claims 17 and 25 are objected to because of the following informalities:

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There is insufficient antecedent basis for the limitations recited in the following claims.

In line 2 of claim 17, "the strobe waveforms"

In lines 19 and 21 of claim 25, "the strobe waveforms"

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1, 22 and 23 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01.

In claim 1, the omitted step is: latching waveform into either stable state to collectively provide a desired display.

In claim 22, the omitted steps are: (a) measuring of the temperature of the liquid crystal material and (b) adjusting voltages to compensate for switching characteristics with temperature.

In claim 23, the omitted step is: selecting the line addressing time to minimize pixel pattern dependence.

Furthermore, the term "to minimize" in claim 23 is a relative term which renders the claim indefinite. The term "to minimize" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary

skill in the art would not be reasonably appraised of the scope of the invention.

Applicant need to specify how small considers to be minimized.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-15, 18, 21 and 23-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Graham et al. (WO 94/18665 PCT submitted in Applicants' IDS).

With respect to claim 1, Graham et al. teach (Figs. 1-2, ***an abstract discloses the same display panel structure used for FLCD and twisted nematic LCD***) a method of addressing a bistable nematic device formed by two cell walls (2, 3) enclosing a layer (7) of nematic liquid crystal material with electrode structures carried by the walls to form a series of row electrodes (6) on one wall (4) and a series of column electrodes (7) on the other wall (3) to form a matrix of intersecting regions or pixels with a wall surface treatment on at least one wall providing a molecular alignment permitting the molecules at or adjacent the wall to align into two different stable states upon application of appropriate unipolar voltage pulses, the method comprising the steps of:

- applying a row waveform to each row in a sequence whilst simultaneously applying one of two data waveforms to each column electrode whereby each pixel can be independently switched between two bistable states;

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- the row waveform having a period of at least two time slots and at least two unipolar pulses for switching the device to a first state, at least two unipolar pulses for switching the device to a second state;
- both data waveforms having a period of at least two time slots with a unipolar pulse in each time slot, with at least one data waveform shaped to combine with the row waveform to cause a switching to one latched state;

whereby each pixel can be addressed to latch into either stable state to collectively provide a desired display, with a substantially net zero dc voltage applied to the device.

wherein

(claim 2)

- the addressing of the device is in two field times, one for switching to one stable state, and the other for switching into the second stable state

(claim 3)

- the field times are of the same length

(claim 5)

- the device is addressed by selectively switching pixels to one state in one field time and selectively switching pixels to the other state in the second field time

(claim 6)

- the two unipolar pulses switching the device to a first state are blanking pulses and the unipolar pulses for switching the device to a second state are

switching pulses, and wherein some or all of the pixels are blanked into one state, then selectively switched to the other state (Figs. 7-20)

(claim 7)

- the row waveform has at least one unipolar pulse of an amplitude capable of blanking pixels, and at least one unipolar addressing pulse of an amplitude capable of combining with data waveforms to selectively switch pixels (Figs. 7-20)

(claim 8)

- the blanking pulses are of equal and opposite amplitude and the switching pulses are of equal and opposite amplitude

(claim 9)

- the blanking pulses are of unequal, including one zero amplitude value, but opposite amplitude and the switching pulses are of unequal, including one zero amplitude value, and opposite amplitude arrange so that overall the device receives substantially net zero dc voltage when addressed

(claim 10)

- the blanking pulses are of the same or different amplitude to those of the switching pulses

(claim 11)

- the blanking and the switching pulses are equally or unequally spaced apart in time

(claim 12)

- the row waveform has at least two unipolar blanking pulses for blanking pixels to one state and at least two unipolar switching pulses for selectively switching pixels to a second state, and each row is addressed in a sequence by the blanking pulses then by the switching pulses in combination with one of the two data waveforms (Figs. 7-20)

(claim 13)

- the blanking pulses and the switching pulses are separated by a period of at least one line address time (Figs. 7-20)

(claim 14)

- during the application of blanking pulses to one row, the columns receive no voltage pulses, the non addressed rows receive no voltage pulses, and pixels not being blanked receive zero voltage

(claim 15)

- the blanking pulses and the switching pulses are separated by a period of at least one line address time during which time the row waveform is of zero amplitude

(claim 18)

- the addressing is by application of the row waveform to each row in turn time (Figs. 7-20)

(claim 19)

- the addressing is by application of the row waveform to each row in an interleaved manner (Figs. 7-20)

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(claim 20)

- additional voltage reduction waveforms are applied to either or both the row waveform and the two data waveforms

(claim 21)

- arranging the surface treatment so that switching to one of the bistable states occurs at a lower voltage than switching to the other bistable state

(claim 23)

- the line addressing time is selected to minimize pixel pattern dependence

(claim 24)

- additional waveforms are applied to the row and or column electrodes to reduce rms voltage levels at the pixels and improve display contrast (abstract)

With respect to claims 25-29, Graham et al. teach (Figs. 1-2, ***an abstract discloses the same display panel structure used for FLC******D and twisted nematic LCD***) forming a bistable nematic device comprising;

(claim 25)

- two cell walls (2, 3) spaced apart and enclosing a layer (7) of nematic liquid crystal material;
- a first series of electrodes (6) on one wall (3) and a second series of electrodes (5) on the other wall (2) collectively forming a matrix of intersecting regions or pixels;

- surface treatments on at least one wall (2, 3) to provide a molecular alignment permitting the molecules at or adjacent the wall to align into two different stable states upon application of appropriate unipolar voltage pulses;
- means (8, 9) for distinguishing between the switched states of the liquid crystal material;
- means (11, 12) for generating and applying a row waveform to each electrode in the first series of electrodes in a sequence;
- means (11, 13) for generating and applying one of two data waveforms to each electrode in the second series of electrodes;
- the row waveform having a period of at least two time slots and at least two unipolar pulses for switching the device to a first state, at least two unipolar pulses for switching the device to a second state;
- both data waveforms having a period of at least two time slots with a unipolar pulse in each time slot, with at least one data waveform shaped to combine with the strobe waveform to cause a switching to the first state and the other data waveform shaped to combine with the strobe waveform to cause a switching to the second state;

wherein

(claim 26)

- the energy levels of liquid crystal molecules at the wall surface alignment treatment in the two stable states are adjusted to be similar so that switching characteristics are the same when switching between the two states

(claim 27)

- the energy levels of liquid crystal molecules at the wall surface alignment treatment in the two stable states are adjusted to be different so that switching characteristics are different when switching between the two states

(claim 28)

- the height to width ratio of a grating wall surface treatment is arranged to give different switching characteristics when the device is switched into the two bistable states

(claim 29)

- means (11-13) for generating and applying to each electrode in either or both the first and second series of electrodes (6, 7) a voltage reduction waveform whereby each pixel can be independently switched into either stable state to collectively provide a desired display, with a substantially net zero do voltage applied to the device

Claims 1-15, 18-21, and 23-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Hughes et al. (US5905482A).

Hughes et al. disclose all limitation in claims 1-3, 5-15, 18-21 and 23-29 as discussed above. Hughes et al. further disclose that the field times are different in length for obtaining different levels of grayscale according to claim 4.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Graham et al. (WO94/18665) or Hughes et al. (US5905482A) as applied to claim 1 above, and further in view of Eaton et al. (US5157525A).

Eaton et al. teach (col. 1 lines 50-68) measuring the temperature of the liquid crystal material and adjusting the voltages to compensate for switching characteristics with temperature for maintaining at the desired mean transmissivity.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Graham et al. or Hughes et al. bistable nematic device with the temperature of the liquid crystal material be measured and the voltages be adjusted to compensate for switching characteristics with temperature for maintaining at the desired mean transmissivity, as taught by Eaton et al.

Allowable Subject Matter

Claims 16 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Claims 16 and 17 would be allowable because there is no prior art of record that teaches the row and data waveforms having the same periods of two, three, four or more time slots.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Yoneda et al. (US20020057242A1) disclose a liquid crystal display apparatus with the row and data waveforms have the same periods.

Huang et al. (US5748277) disclose a dynamic drive method with the row and data waveforms have the different amplitudes and periods.

Hughes et al. (US5748166A) an addressing FLCN with the row waveforms have the same periods.

Contact Information


Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Julie-Huyen L. Ngo whose telephone number is (703) 305-3508. The Examiner can normally be reached on T-Friday.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Robert H. Kim can be reached at (703) 305-3492.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

June 26, 2003



Julia Huyen L. Ngo
Patent Examiner
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